Remarks

The Applicant respectfully submits that the newly added claims are patentable over the references cited by the Patent Office. In particular, the combination of the air dam and the air distributor divides the roll into at least four chambers (inner/outer/front/rear) in both the axial/longitudinal direction as well as the radial direction. This feature is not known from either of the references cited by the Patent Office. These and further distinctions between the claimed invention and the references are highlighted below.

Rejection Under 35 U.S.C. § 102:

The Patent Office rejected claims 1-4 and 7-9 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 5,020,242 to Mayer et al. These claims have been cancelled, and it is submitted that new claims 16-21 are novel over Mayer et al. as illustrated below.

Claim 16 of the present application is directed towards a drying cylinder roll for the through-air-processing of permeable and semi-permeable webs. The cylinder roll has a number of features that are not found in the cited prior art. For example, claim 16 recites a plurality of radial plates defining a plurality of conduits, an air distributor disposed concentrically about an axial hub and dividing the plurality of conduits into an outer chamber and an inner chamber, an air dam radially disposed about the hub, the air dam dividing the outer chamber into a front chamber and a rear chamber, such that air used in the drying of permeable and semi-permeable webs would enter through the front chamber of the cylinder roll and exit through the rear chamber of the cylinder roll.

As noted in the specification of the present application, the entirety of the cylinder roll, including all of the features outlined above, is rotatable about a longitudinal axis. See e.g., specification at p. 1, lines 20-25. This construction is novel over the prior art, which traditionally has divided drying rolls into a stationary air distribution duct and a rotatable outer sleeve. The Mayer et al. reference is no exception, stating that the guide roll (1) is divided into a perforated rotating roll shell (2) and a stationary air guide box (3). See Col. 2, lines 37-39. As such, although Mayer et al. certainly discloses air distribution means that are known in the prior art, it does not disclose or teach a singular, integrated rotatable drying cylinder roll that has the air distribution means incorporated therein, as claimed in new claim 16.

The novel design affords a number of advantages not associated with prior art designs, including Mayer et al., taken alone or in combination with other cited prior art. These include,

for example, radial through-drum exhausting of the air through the rear chamber, thereby enabling the exhaust duct to be located above the roll as opposed to being attached to its side, which substantially reduces the footprint of the machinery involved in through air drying. Additionally, this design allows a user to control the exhaust pressure because the exhaust area is directly proportional to that portion of the roll that contains the rear chamber. Therefore, by increasing the size of the rear chamber, a manufacturer can increase the exhaust area of the roll, which decreases the relative exhaust velocity and pressure loss required to maintain a given air velocity uniformly through the product to be dried. The decrease in exhaust velocity reduces the energy required per unit of product produced for the device that moves the air. Typically, the airflow is driven by an electric fan, and thus electrical energy is saved through the design of the present invention. Control over the exhaust area is not a feature found in the prior art designs, including Mayer et al., because the exhaust area is necessary limited to the axial profile of the stationary drum. See e.g., Mayer et al., Col. 3, lines 34-38. As such, the prior art designs are limited in their ability to control the velocity of the exhaust air because the area through which the exhaust air must pass is necessarily fixed, unlike the present invention.

Accordingly, the Applicant hereby submits that claim 16 is in condition for allowance, as each and every limitation is not disclosed in the Mayer et al. reference. On the contrary, Mayer et al. specifically teaches away from the present invention by utilizing a dated model for drying by dividing the rotatable screen from the stationary the air distribution means. As claims 17-21 depend, directly or indirectly, from claim 16, it is respectfully submitted that they are also in condition for allowance.

Rejection Under 35 U.S.C. § 103:

The Patent Office has rejected claims 5-6 and 13-15 under 35 U.S.C. §103(a) as being unpatentable over Mayer et al. in view of U.S. Patent 5,775,002 to Iwase et al. As noted above, the invention as claimed in Claim 16 is novel in view of Mayer et al., and the novel features impart a number of significant advantages over prior art designs, including in particular those designs suggested by the combination of Mayer et a. and Iwase et al. Accordingly, the Applicant respectfully submits that claims 16-21 are in condition for allowance as presented above.

Summary

In light of the above amendment, consideration of the subject patent application is respectfully requested. The Examiner is invited to call the Undersigned with any questions concerning this Amendment, or for approval to enter any Examiner's Amendment deemed appropriate. Any deficiency or overpayment should be charged or credited to Deposit Account No. 500282.

Respectfully submitted,

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Portsmouth, NH
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